

Before the  
Federal Communications Commission  
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

In the Matter of

Amendment of the Amateur Service  
Rules to Provide For Greater Use of  
Spread Spectrum Communication  
Technologies

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WT Docket No.97-12

To: The Commission

## REPLY COMMENTS OF RAPHAEL SOIFER, W2RS

1. I filed Comments in this proceeding on May 5, 1997. I have since reviewed the Comments filed by Radio Amateur Satellite Corporation (AMSAT), Central States VHF Society (CSVHFS), American Radio Relay League (ARRL), Tucson Amateur Packet Radio (TAPR), Metricom Inc. (Metricom), The Part 15 Coalition (Coalition), William A. Tynan (Tynan), Philip R. Karn, Jr. (Karn), Robert J. Carpenter (Carpenter), Robert A. Buaas (Buaas) and Lyle V. Johnson, Jr. (Johnson). The following Reply Comments are provided with respect to the Comments reviewed.

2. As noted in my Comments, I support the views of AMSAT with respect to frequencies utilized by the Amateur-satellite Service but believe that AMSAT's proposals do not go far enough in protecting amateur earth-moon-earth (EME) communication, which because of the extremely weak signals involved is far more

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susceptible to potential interference from spread-spectrum (SS) emissions than is communication via amateur radio satellite.

3. CSVHFS, Carpenter and Tynan agree with me as to the need to protect narrowband weak-signal operations, such as satellites and EME, from potential SS interference, but propose a different remedy: a restriction on SS based upon bandwidth, rather than purpose. Their proposals also represent a workable approach to the problems presented, as do those made in my own Comments.

4. TAPR and Karn propose to extend amateur SS operation to the 50, 144 and 222 MHz bands. I oppose this proposal for the reasons discussed in my Comments.

5. TAPR, Karn and Johnson take issue with the Commission's proposals to require automatic power control, while TAPR and Karn also oppose the Commission's proposed power limit of 100 W and any requirement for station identification using CW or other non-SS emission. I take their points, but they only serve to illustrate the difficulties which would be faced by non-SS, narrowband stations attempting weak-signal operation in the presence of SS interference. I would not oppose their suggestions as long as appropriate frequency restrictions on

SS operation are adopted, e.g., those proposed in my Comments, or those of CSVHFS, Carpenter or Tynan.

6. If the Commission permits amateur SS stations to use power in excess of 100 W, the interference calculations presented by AMSAT, CSVHFS, Tynan and Carpenter would have to be amended accordingly. For example, a station transmitting the maximum power proposed by TAPR and Karn, 1.5 kW, would produce SS signals approximately 11.8 dB stronger than those assumed by AMSAT, CSVHFS, Tynan and Carpenter in their Comments.

7. Buaas states his opinion that the fears of interference to narrowband weak-signal operation expressed by commenters such as myself, AMSAT, CSVHFS et al are merely "conjectures of doom as fact, without bothering to conduct any realistic tests." I have no idea what Buaas considers to be "realistic." The types of emission and power levels proposed in the NPRM, as well as by commenters such as TAPR and Karn, are so broadly defined as to admit a virtually infinite number of possible scenarios. In this situation, it is entirely appropriate, as well as prudent, to base one's analysis on the worst case that would be permissible under the proposed regulations.

8. In any event, Buaas is wrong about the existence of tests. Radio amateurs in the United Kingdom have made detailed and fully documented measurements of the interference to amateur weak-signal operation caused by what they believe to be a military SS system operating in the 70 cm band. According to one such set of measurements posted to the Internet by David G. L. Anderson, GM4JJJ, of Braeside, Scotland, an SS transmitter with power output believed to be 2.5 kW produced interference approximately 30 MHz wide, centered on 430 MHz. At a distance of 10 miles from the transmitter, the received signal strength of this interference was 13 dB over the ambient noise level with a receiving antenna of 17 dBi gain. Over line-of-sight paths such as the one prevailing in these measurements, a 25 W transmitter at one mile, or a 100 W transmitter at two miles, would produce interference of equivalent received signal strength to that of a 2.5 kW transmitter at 10 miles. Spectrum analyzer plots of the interference in question, as received, may be viewed or downloaded from Mr. Anderson's Web site at <http://www.braeside.demon.co.uk/SSQRM/432QRM.html>.

9. Metricom and Coalition propose that amateur SS operation in the 902-928 MHz and 2400-2450 MHz bands be limited to the same power level as is currently permitted for Part 15 users, i.e., one watt. Their proposals conveniently ignore the fact that Part 15 users are unlicensed and, therefore, are entitled to no protection

whatever from licensed services. Adoption of their proposal, or for that matter, any restrictions on amateur operation designed to protect Part 15 users would be contrary to law and to established public policy, i.e., furtherance of the purposes and objectives of the Amateur and Amateur-satellite Services as set forth in the Communications Act and in section 97.1 of the Commission's Rules.

10. We now come to the issue of the best manner of determining the proper frequencies for amateur SS operation. On this point, ARRL comments as follows:

"In any case, amateurs are called upon to cooperate in the use of shared frequency bands regardless of emission type. As has always been the case, advance planning and coordination will facilitate harmonious use of both SS and narrowband communications modes. Any fear of interference to ... weak-signal communications can and should be avoided by intraservice cooperation in the selection of frequencies, rather than by restricting emission types for SS communications. The latter has served to restrict the ability to experiment with SS communications."

11. Coming from ARRL, these comments are surprising, to say the least. ARRL, the only existing U.S. organization in a position to organize such efforts on a national basis, in recent years has run away from band planning and frequency coordination as rapidly as humanly possible, leaving U.S. radio amateurs today with no organizational framework whatsoever which would be capable of implementing the "advance planning," "coordination" and "intraservice cooperation" to which its Comments refer. The present "ARRL Band Plans" covering VHF and UHF

frequencies were developed some years ago by a "VHF-UHF Advisory Committee" which ARRL has since seen fit to abolish. This was replaced by a "Spectrum Management Committee" which has since also been abolished, leaving ARRL with no organized structure for band planning at all. ARRL's Comments are silent as to how it would propose to implement the "advance planning and coordination" which it assumes, but the recent history of this organization in spectrum management matters provides the amateur weak-signal community with no comfort whatsoever. I say this with regret, as an ARRL member, but facts are facts.

12. I understand that ARRL is cooperating with various regional frequency coordinators in the organization of a national conference through which these groups might pool their resources. However, under the Commission's Rules, the jurisdiction of such coordinators extends only to amateur repeater and remote base stations, and then only within such band segments in which these types of stations are permitted. Thus, the present structure of regional frequency coordination would provide no relief to amateur satellite, EME and other weak-signal operations.

13. It must also be noted that EME and satellite operations are inherently international in scope. It would, therefore, not be appropriate to subject them to regional frequency coordination, since there would then be nothing in the Rules to ensure that coordinators in different U.S. regions do not designate different

frequencies for such uses, rendering them incompatible with one another on a national or international scale. In this case, regional frequency coordination is not the answer.

14. Thus, the Amateur Service is without any organizational framework through which the voluntary cooperation contemplated in ARRL's Comments might be carried out, and the only national organization of U.S. radio amateurs capable of providing one (ARRL itself) has consistently and repeatedly avoided such a role. TAPR and Karn suggest that amateur SS experimenters might publish information about their activities on the Internet. However, this would not in any way prevent interference to satellite, EME and other weak-signal operation.

15. This leaves the Commission as the only body capable of acting to protect amateur weak-signal operation. The allocation of different amateur sub-bands to various modes of emission is as old as government regulation of amateur radio itself. Indeed, the first such regulations were imposed by the Commission's predecessor, the Federal Radio Commission, which in turn had inherited them from the former Hoover Commissions of the U.S. Department of Commerce. Over the years, U.S. amateurs have proven to be remarkably law-abiding. However, someone must first make the rules, and in this case the only available rulemaker is the Commission itself.

16. I concur with ARRL's observation that restriction of emission types for SS communication has tended to restrict the ability to experiment. This is why I do not propose to restrict SS emission types, only the frequencies on which they may be transmitted. As noted in my Comments, this would serve to protect other types of amateur experimentation, e.g., satellite and EME, while at the same time giving free rein to the development of SS technology in the Amateur Service. Based upon the results of such experimentation, the Commission may, at some future time, revisit the issue of frequencies for amateur SS communication and make whatever changes are appropriate in the light of what has been learned from such experiments.

17. My Comments of May 5, 1997, are hereby incorporated into this document by reference.

18. Copies of these Reply Comments have been served upon the commenters cited herein.

RESPECTFULLY SUBMITTED,

A handwritten signature in cursive script, appearing to read 'Raphael Soifer'.

Raphael Soifer, W2RS  
60 Waldron Avenue  
Glen Rock, New Jersey 07452

June 5, 1997